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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BARNES, CRYSTAL J	
ART UNIT	**PAPER NUMBER**
2121	

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Please find below and/or attached an Office communication concerning this application or proceeding.

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PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/835,824	UMEZU ET AL.	
	Examiner	Art Unit	
	Crystal J. Barnes	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 17 April 2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-3,7,9-15,17-21,24-26 and 28-34 is/are rejected.

7)☒ Claim(s) 4-6,8,16,22,23 and 27 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 17 April 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. The following is an initial Office Action upon examination of the above-identified application on the merits. Claims 1-34 are pending in this application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement filed 14 September 2001 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. The transmittal has been placed in the application file, but the information referred to therein has not been considered.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference numbers 800 in figure 2 and S962 in figure 16.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "260" has been used to designate both exit in figure 2 and processing information receiving unit in figure 1.

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "10" and "50" have both been used to designate Ethernet (see figure 14).

7. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet,

even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

8. The disclosure is objected to because of the following informalities: reference characters "210" and "220" have both been used to designate display unit (see page 16 lines 6 and 13), reference characters "100" and "200" have both been used to designate control host (see page 44 lines 11-12 and page 46 line 24). Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 11, 20 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 11 recites the limitations "said command generating unit and said command transferring unit" in line 5. There is insufficient antecedent basis for these limitations in the claim. Claim 2 recites the limitations "a command generating unit and a command transferring unit" in lines 5 and 7.

12. Claim 20 recites the limitation "said control command" in lines 14-15. There is insufficient antecedent basis for this limitation in the claim.

13. Claim 33 recites the limitation "said control step" in line 2. There is insufficient antecedent basis for this limitation in the claim. Claim 32 recites the limitation "a control step" in line 9.

14. Furthermore, claim 33 includes process of use limitations. Claim 33 depends from an apparatus claim. It is considered that claim 33 is indefinite since a person who makes or sells the apparatus would not be adequately informed as to whether they would infringe claim 33 since it would require use of the apparatus.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16. Claims 1, 12, 17-19, 24, 25, 28, 29, 30-32 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN 6,233,534 B1 to Morozumi et al.

As per claim 1, the Morozumi et al. reference discloses a measuring device controlling adapter coupled to a first network and to a measuring unit for performing a measurement process comprising: a program receiving unit (see column 5 lines 9-13, "communication portion 23") for receiving a control program (see column 10 line 30, "program") for performing said measurement process from said first network (see column 4 lines 43-46, "network"); a memorizing unit (see column 5 lines 4-8, "memory 22") for memorizing said control program ("program"); an initiating instruction receiving unit ("communication portion 23") for receiving a

program initiating instruction (see column 5 lines 9-13, "measurement start command") of said measurement process by the measuring unit (see column 5 lines 1-3, "measuring portion 21") through said first network ("network"); and a measurement control unit (see column 5 lines 15-19, "control portion 25") for letting said measuring unit ("measuring portion 21") perform said measurement process based on said control program ("program") memorized by said memorizing unit ("memory 22") in case said initiating instruction receiving unit ("communication portion 23") receives said program initiating instruction ("measurement start command").

As per claim 12, the Morozumi et al. reference discloses a measuring device (see column 4 lines 41-46, "measuring units 10") comprising a measuring device controlling adapter (see column 4 lines 54-57, "main body 11") and said measuring unit ("measuring portion 21") for performing said measurement process.

As per claim 17, the Morozumi et al. reference discloses said control program ("program") comprises contents prescribing a plurality of measurement processes (see column 5 lines 4-8, "measuring intervals"), a performing sequence determining unit (see column 5 lines 14-15, "counter 24") for determining a sequence for performing a plurality of measurement processes ("measuring

intervals") based on the control program ("program"), wherein the measurement control unit ("control unit 25") lets said plurality of measurement processes ("measuring intervals") be performed according to the sequence (see column 5 lines 4-6, "sequentially record measured temperature data").

As per claim 18, the Morozumi et al. reference discloses further comprising: a measurement process information memorizing unit (see column 5 lines 1-3, "memory 22") for memorizing measurement process information ("temperatures measured") which identifies said measurement process which can be performed in parallel (see column 5 lines 4-8, "record measured temperature data and record other data"), wherein said measurement control unit ("control portion 25") lets said measurement process, which can be performed in parallel, be performed in parallel based on said measurement process information ("temperatures measured").

As per claim 19, the Morozumi et al. reference discloses a measuring system comprising: a measuring device (see column 4 lines 41-46, "measuring units 10"), which comprises a measuring unit (see column 5 lines 1-3, "measuring portion 21") for performing a measurement process; and a control host (see column 4 lines 38-40, "personal computer 2"), which controls said measurement process by said measuring device ("measuring units 10") through a first network (see column 43-46,

"network"), wherein said control host ("personal computer 2") comprises: a program transferring unit (see column 5 lines 50-56, "communication portion 31") for transferring a control program (see column 4 lines 52-53, "programs") to said measuring device ("measuring units 10"); and an initiating instruction transferring unit ("communication portion 31") for transferring a program initiating instruction (see column 5 lines 59-60, "start of the measurement can be instructed") of measurement process of said measuring device ("measuring units 10"), and said measuring device ("measuring units 10") comprises: a program receiving unit (see column 5 lines 30-36, "communication portion 23") for receiving said control program (see column 10 lines 30-32, "programs") from said first network ("network"); a memorizing unit (see column 5 lines 4-8, "memory 22") for memorizing said control program ("programs"); an initiating instruction receiving unit ("communication portion 23") for receiving a program initiating instruction (see column 5 lines 9-13, "measurement start command") of said measurement process; and a measurement control unit (see column 5 lines 15-19, "control unit 25") for controlling said measuring device ("measuring units 10") based on said control program ("programs") memorized by said memorizing unit ("memory 22") in case

said initiating instruction receiving unit ("communication portion 23") receives said program initiating instruction ("measurement start command").

As per claim 24, the Morozumi et al. reference discloses said control host ("personal computer 2") further comprising an initiating instruction transferring unit ("communication portion 31") for transferring a program initiating instruction ("start of the measurement can be instructed") of said control program ("programs"), and said initiating instruction transferring unit ("communication portion 31") receives said program initiating instruction ("start of the measurement can be instructed") through said first network ("network").

As per claim 25, the Morozumi et al. reference discloses said measuring device ("measuring units 10") further comprises a processing information transferring unit ("communication portion 23") for transferring processing information (see column 5 lines 9-13, "measurement data") relating to said measurement process to said control host ("personal computer 2") through said first network ("network"), and said control host ("personal computer 2") further comprises a processing information receiving unit ("communication portion 31") for receiving said processing information transferred (see column 5 lines 50-56, "measurement data") from said processing information transferring unit

("communication portion 23"); and a display unit (see column 5 lines 56-59, "display unit 4") for displaying said processing information ("measurement data").

As per claim 28, the rejection of claim 17 is incorporated and further claim 28 contains limitations recited in claim 17; therefore claim 28 is rejected under the same rationale as claim 17.

As per claim 29, the rejection of claim 18 is incorporated and further claim 29 contains limitations recited in claim 18; therefore claim 29 is rejected under the same rationale as claim 18.

As per claim 30, the rejection of claim 1 is incorporated and further claim 30 contains limitations recited in claim 1; therefore claim 30 is rejected under the same rationale as claim 1.

As per claim 31, the rejection of claim 18 is incorporated and further claim 31 contains limitations recited in claim 18; therefore claim 31 is rejected under the same rationale as claim 18.

As per claim 32, the rejection of claim 1 is incorporated and further claim 32 contains limitations recited in claim 1; therefore claim 32 is rejected under the same rationale as claim 1.

As per claim 34, the rejection of claim 1 is incorporated and further claim 34 contains limitations recited in claim 1; therefore claim 34 is rejected under the same rationale as claim 1.

17. Claims 1, 3, 9, 11-14, 19, 30-32 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN 6,338,030 B1 to Senn et al.

As per claim 1, the Senn et al. reference discloses a measuring device controlling adapter coupled to a first network and to a measuring unit for performing a measurement process comprising: a program receiving unit (see column 3 lines 45-49, "processor 3") for receiving a control program ("control program 31") for performing said measurement process (see column 2 lines 65-67, "detects desired parameter to be measured") from said first network (see column 2 lines 62-64, "network 7"); a memorizing unit (see column 2 lines 60-62, "working and program memory 4") for memorizing said control program ("control program 31"); an initiating instruction receiving unit ("processor 3") for receiving a program initiating instruction (see column 3 lines 22-28, "control data") of said measurement process ("detects desired parameter to be measured") by the measuring unit (see column 2 lines 65-67, "measuring unit 1") through said first

network ("network 7"); and a measurement control unit ("processor 3") for letting said measuring unit ("measuring unit 1") perform said measurement process ("detects desired parameter to be measured") based on said control program ("control program 31") memorized by said memorizing unit ("memory 4") in case said initiating instruction receiving unit ("processor 3") receives said program initiating instruction ("control data").

As per claim 3, the Senn et al. reference discloses further comprising: a measurement result transferring unit (see column 4 lines 15-18, "file system program 32") for transferring said measurement result (see column 3 lines 20-25, "data exchange") through said first network ("network 7").

As per claim 9, the Senn et al. reference discloses said first network ("network 7") is Ethernet (see columns 3-4 lines 63-2, "Ethernet").

As per claim 11, the Senn et al. reference discloses further comprising a program running unit (see column 4 lines 4-5, "web server program 36") capable of executing a program described in Java (TM) language (see column 6 lines 7-12, "programmed in java"), wherein said control program ("firmware (control program)") is described in Java language ("java"), and at least one of said command generating unit ("processor 3") and said command transferring unit ("processor 3") is

embodied by said program running unit ("web server program 36") which executes said control program ("firmware (control program)").

As per claim 12, the Senn et al. reference discloses a measuring device (see column 2 lines 58-60, "measuring device") comprising a measuring device controlling adapter ("control arrangement 2") and said measuring unit ("measuring unit 1") for performing said measurement process ("detects desired parameter to be measured").

As per claim 13, the Senn et al. reference discloses said initiating instruction receiving unit ("processor 3") receives a program initiating instruction ("control data") of said control program ("control program 31") from said first network ("network 7").

As per claim 14, the Senn et al. reference discloses further comprising: a processing information transferring unit ("file system program 32") for transferring information ("data exchange") relating to said measurement process ("detects desired parameter to be measured") through said first network ("network 7").

As per claim 19, the Senn et al. reference discloses a measuring system comprising: a measuring device (see column 2 lines 58-60, "measuring device"),

which comprises a measuring unit ("measuring unit 1") for performing a measurement process; and a control host (see column 2 lines 62-64, "external processor 8"), which controls said measurement process by said measuring device ("measuring device") through a first network ("network 7"), wherein said control host ("external processor 8") comprises: a program transferring unit (see column 3 lines 20-28, "transfer of control data") for transferring a control program ("control data") to said measuring device ("measuring device"); and an initiating instruction transferring unit for transferring ("transfer of control data") a program initiating instruction ("control data") of measurement process of said measuring device ("measuring device"), and said measuring device ("measuring device") comprises: a program receiving unit (see column 3 lines 45-49, "processor 3") for receiving said control program ("control program 31") from said first network ("network 7"); a memorizing unit (see column 2 lines 60-62, "working and program memory 4") for memorizing said control program ("control program 31"); an initiating instruction receiving unit ("processor 3") for receiving a program initiating instruction ("control data") of said measurement process; and a measurement control unit ("processor 3") for controlling said measuring device ("measuring device") based on said control program ("control program 31")

memorized by said memorizing unit ("memory 4") in case said initiating instruction receiving unit ("processor 3") receives said program initiating instruction ("control data").

As per claim 30, the rejection of claim 1 is incorporated and further claim 30 contains limitations recited in claim 1; therefore claim 30 is rejected under the same rationale as claim 1.

As per claim 31, the rejection of claim 18 is incorporated and further claim 31 contains limitations recited in claim 18; therefore claim 31 is rejected under the same rationale as claim 18.

As per claim 32, the rejection of claim 1 is incorporated and further claim 32 contains limitations recited in claim 1; therefore claim 32 is rejected under the same rationale as claim 1.

As per claim 34, the rejection of claim 1 is incorporated and further claim 34 contains limitations recited in claim 1; therefore claim 34 is rejected under the same rationale as claim 1.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. Claims 2, 7, 9, 10, 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,338,030 B1 to Senn et al. in view of USPN 6,052,653 to Mazur et al.

As per claim 2, the Senn et al. reference discloses said measuring device controlling adapter (see column 3 lines 7-12, "control arrangement 2") is coupled to a second network; and said measurement control unit ("processor 3") comprises a command generating unit ("processor 3") for generating a control command (see column 3 lines 45-49, "provides all functionalities") which controls said measuring unit ("measuring unit 1"); a command transferring unit ("processor 3") for transferring said control command (see column 3 lines 45-49, "communicates") to said measuring unit ("measuring unit 1") through said second network; and a measurement result receiving unit ("processor 3") for receiving a measurement

result (see columns 2-3 lines 67-6, "measured parameters") of said measurement process ("detects desired parameter to be measured") from said measuring unit ("measuring unit 1").

The Senn et al. reference does not expressly disclose said measuring device controlling adapter is coupled to a second network.

The Mazur et al. reference discloses

(see column 5 lines 14-15, "The low level controller ... medium performance personal computer.")

(see column 5 lines 20-30, "... control cards ... interfacing with the probe unit ... GPIB Communications Card for communicating with the data gathering hardware of the probe unit ... industrial standard high quality Ethernet card for interfacing with the high level controller 17. The low level controller 13 takes instructions from the high level controller 17.")

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the control arrangement taught by the Senn et al. reference to include the control cards of the low level controller taught by the Mazur et al. reference.

One of ordinary skill in the art would have been motivated to modify the control arrangement to include the control cards of the low level controller to permit interfacing with various external devices regardless of the protocol.

As per claim 7, the Senn et al. reference discloses said measurement result transferring unit (see column 4 lines 30-32, "data-transfer program 33") converts said measurement result ("detected data") into data of a predetermined format ("defined format"), and transfers an object (see column 4 lines 15-18, "file system") having said measurement result converted ("file") in said predetermined data format ("defined format") and information for reconverting (see column 4 lines 33-35, "converts") said converted measurement result ("control files") into original one ("control data") to said second network.

As per claim 9, the Mazur et al. reference discloses said first network ("interfacing with the high level controller 17") is Ethernet (see column 5 lines 27-29, "Ethernet card").

As per claim 10, the Mazur et al. reference discloses said second network ("communicating with the data gathering hardware of the probe unit") is GPIB (see column 5 lines 23-26, "National Instruments PCII-A GPIB Communications Card").

As per claim 15, the Senn et al. reference does not expressly disclose said measuring device is coupled to a third network, said control program further comprises contents relating to another measurement process performed by another measuring device coupled to said third network, and said measurement control unit further lets said other measuring device perform said other measurement process based on said control program.

The Mazur et al. reference discloses

(see column 5 lines 14-15, "The low level controller ... medium performance personal computer.")

(see column 5 lines 20-30, "... control cards ... Four axis Motion Controller ... Remote Controller for interfacing with the probe unit and the motorized objective circuits ... GPIB Communications Card for communicating with the data gathering hardware of the probe unit ... industrial standard high quality Ethernet card for interfacing with the high level controller 17. The low level controller 13 takes instructions from the high level controller 17.")

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the control arrangement taught by the Senn

et al. reference to include the control cards of the low level controller taught by the Mazur et al. reference.

One of ordinary skill in the art would have been motivated to modify the control arrangement to include the control cards of the low level controller to permit interfacing with various external devices regardless of the protocol.

As per claim 20, the Senn et al. reference discloses said measuring device ("measuring device") is coupled to said control host through said first network, further comprising a measuring device controlling adapter ("measuring device") coupled to said measuring unit ("measuring unit 1") through a second network, wherein said measuring device controlling adapter ("measuring device") comprises: a program receiving unit ("processor 3") for receiving a control program ("control program 31") for controlling said measuring device ("measuring device") from said first network ("network 7"); a memorizing unit ("working and program memory 4") for memorizing said control program ("control program 31"); an initiating instruction receiving unit ("processor 3") for receiving a program initiating instruction ("control data") of said measurement process by said measuring unit ("measuring unit 1") through said first network ("network 7"); and a command

generating unit ("processor 3") for generating a control command (see column 3 lines 45-49, "provides all functionalities") based on said control program ("control program 31") memorized by said memorizing unit ("working and program memory 4") in case said program initiating instruction ("control data") is received; a command transferring unit ("processor 3") for transferring said control command ("provides all functionalities") to said measuring device ("measuring device") through said second network based on said control program ("control program 31") memorized by said memorizing unit ("working and program memory 4"); and a measurement result receiving unit ("processor 3") for receiving a measurement result (see columns 2-3 lines 67-6, "measured parameters") of said measurement process from said measuring device ("measuring device"), and said measuring unit ("measuring unit 1") comprises: a measuring unit ("measuring unit 1") for performing a measurement process based on said transferred control command ("control data"); and a measurement result transferring unit (see 3 lines 7-9, "electrical signals produced") for transferring a measurement result ("electrical signals") of said measurement process to said measuring device controlling adapter ("measuring device").

The Senn et al. reference does not expressly disclose a measuring device controlling adapter coupled to said measuring unit through a second network.

The Mazur et al. reference discloses

(see column 5 lines 14-15, "The low level controller ... medium performance personal computer.")

(see column 5 lines 20-30, "... control cards ... interfacing with the probe unit ... GPIB Communications Card for communicating with the data gathering hardware of the probe unit ... industrial standard high quality Ethernet card for interfacing with the high level controller 17. The low level controller 13 takes instructions from the high level controller 17.")

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the control arrangement taught by the Senn et al. reference to include the control cards of the low level controller taught by the Mazur et al. reference.

One of ordinary skill in the art would have been motivated to modify the control arrangement to include the control cards of the low level controller to permit interfacing with various external devices regardless of the protocol.

20. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,338,030 B1 to Senn et al. in view of USPN 6,052,653 to Mazur et al. as applied to claim 20 above, and further in view of USPN 6,233,534 B1 to Morozumi et al.

As per claim 21, the Morozumi et al. reference discloses further comprising: a display host (see column 4 lines 46-50, "display unit 4") for displaying a result of said measurement process by said measuring device (see column 4 lines 38-46, "measuring units 10"), said display host ("display unit 4") being coupled to said measuring device controlling adapter ("measuring units 10") through said first network ("network"), wherein said measuring device controlling adapter ("measuring units 10") comprises a measurement result transferring unit (see column 5 lines 9-13, "communication portion 23") for transferring said measurement result ("measurement data") through said first network ("network"), and said display host ("display unit 4") comprises: a second measurement result receiving unit (see column 5 lines 50-59, "communication portion 31") for receiving said measurement result ("measurement data") transferred from said measurement result transferring unit ("communication portion 23"); and a display unit (see column 5 lines 56-59, "display unit 4") for displaying said measurement result ("measurement data").

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the external processor taught by the Senn et al. reference with the high level controller taught by the Mazur et al. reference and further modify the high level controller with the personal computer taught by the Morozumi et al. reference to illustrate an operator interface for managing measuring units/devices.

One of ordinary skill in the art would have been motivated to modify the external processor with the high level controller and further modify the high level controller with the personal computer to illustrate an operator interface for managing measuring units/devices to provide a measuring system incorporating measuring units/devices to periodically supply results of the measurement to a managing apparatus, such as a personal computer.

21. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,233,534 B1 to Morozumi et al. in view of USPN 6,052,653 to Mazur et al.

As per claim 26, the Morozumi et al. reference does not expressly disclose said measuring device is further coupled to another network, said control program further comprises contents relating to another measurement process performed by another measuring device coupled to said other network, and said measurement

control unit further controls another measurement process by said other measuring device based on said control program.

The Mazur et al. reference discloses

(see column 5 lines 14-15, "The low level controller ... medium performance personal computer.")

(see column 5 lines 20-30, "... control cards ... Four axis Motion Controller ... Remote Controller for interfacing with the probe unit and the motorized objective circuits ... GPIB Communications Card for communicating with the data gathering hardware of the probe unit ... industrial standard high quality Ethernet card for interfacing with the high level controller 17. The low level controller 13 takes instructions from the high level controller 17.")

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the measuring unit taught by the Morozumi et al. reference to include the control cards of the low level controller taught by the Mazur et al. reference.

One of ordinary skill in the art would have been motivated to modify the control arrangement to include the control cards of the low level controller to permit interfacing with various external devices regardless of the protocol.

Allowable Subject Matter

22. Claim 4-6, 8, 16, 22, 23, 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

23. The following is a statement of reasons for the indication of allowable subject matter:

As per claim 4, the prior art of record taken alone or in combination fail to teach a measurement result transferring unit transfers the measurement result to the transfer destination based on the identification information.

As per claim 6, the prior art of record taken alone or in combination fail to teach a command generating unit selects the control program being performed from the memorizing unit based on the program initiating instruction and generates the control command based on the control program.

As per claim 8, the prior art of record taken alone or in combination fail to teach an error information transferring unit for transferring information relating to said error through said first network.

As per claims 16 and 27, the prior art of record taken alone or in combination fail to teach a measuring device identifying unit for identifying the measuring device which performs the measurement process of the control program based on information of the measuring device information memorizing unit, wherein the measurement control unit lets the identified measuring device perform said measurement process.

As per claim 22, the prior art of record taken alone or in combination fail to teach a measurement result transferring unit transfers the measurement result to a display host of the transfer destination based on the identification information.

As per claim 23, the prior art of record taken alone or in combination fail to teach an error information transferring unit for transferring information relating to the error to the control host through the first network.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to remote monitoring/control devices in general:

USPN 6,363,294 B1 to Coronel et al.

USPN 5,903,724 Takamoto et al.

V. R. Bom et al., "Diverse setups controlled by one graphical user interface", 11th IEEE NPSS Real Time Conference, Santa Fe, 14-18 June 1999, Pages 271 - 272.

C. Perello et al., "An open system to interface IEEE-488 measurement devices designed in a microelectronics environment", IMTC, 'Quality Measurements: The Indispensable Bridge between Theory and Reality', Volume: 1, 1996, Pages: 192 - 195.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Crystal J. Barnes whose telephone number is 703.306.5448 or 571.272.3679 after 14 October 2004. The examiner can normally be reached on Monday-Friday alternate Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 703.308.3179 or 571.272.3687 after 14 October 2004. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CJB
17 September 2004

Anthony Knight
Supervisory Patent Examiner
Group 3600

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	Examiner Crystal J. Barnes	Art Unit 2121	Page 1 of 1

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	S					
	T					

NON-PATENT DOCUMENTS

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	U	V. R. Bom et al., "Diverse setups controlled by one graphical user interface", 11th IEEE NPSS Real Time Conference, Santa F 14-18 June 1999, Pages 271 – 272.
	V	C. Perello et al., "An open system to interface IEEE-488 measurement devices designed in a microelectronics environment", IMTC, 'Quality Measurements: The Indispensable Bridge between Theory and Reality', Volume: 1, 1996, Pages: 192 - 195.
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Diverse Setups Controlled by One Graphical User Interface

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Abstract

Experimental setups, which differ widely in nature, are all controlled by one and the same Graphical User Interface (GUI). The setups have a common hardware structure: a host computer connects via Ethernet to a front-end, and this front-end services the measurement equipment.

To establish the mentioned setup independence all setup specific information is stored in the front-end. The GUI will extract this information and use it to construct a front panel.

LabVIEW [1] is used for programming the GUI.

I. Introduction

In our institute IRI [2] there are many relatively small experimental setups but of a widely varying nature. There are p.e. simple spectroscopic setups and stepper motor controlled Si-wafer scanner devices, but also large setups connected to our nuclear test reactor. The unifying characteristic is that the DAQ hardware is distributed: front-end systems are connected via a LAN to workstations (see figure 1).

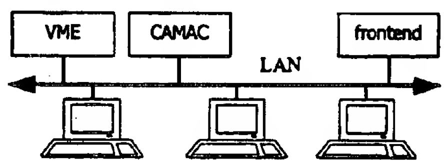

Figure 1: The distributed nature of the DAQ system.

The front-end performs the measurement in a stand-alone fashion; the workstation is used for control only. The front-end could be any intelligent system, but in our case it is a CAMAC or a VME crate. The hardware of the crate differs according to the specific setup. Also the crate software varies: while VxWorks [3] runs in the CAMAC stations, OS9 [4] runs in the VME stations. Since the various setups belong to different groups the DAQ software in the front-ends also differs widely. The workstations on the other hand are all windows PCs, but the various groups use different DAQ software.

Since the need has arisen to upgrade the existing DAQ system we searched for an existing package that could cope with the situation. Because no such package was found the task of 'making something ourselves' was undertaken. It was not felt appropriate to try to unify all front-ends since they differ so much. But where the workstations are concerned it is possible to have one user interface, which is capable of serving every setup. We have chosen LabVIEW to make this GUI because it is a powerful development environment and because of its graphical nature.

II. The Graphical User Interface

A. Design Considerations

When one GUI is to be used with all front-ends we need one protocol for communication with is supported by all front-ends. The definition of this protocol includes:

i. the bit-mapping of basic IO structures which can be exchanged with a front-end,
ii. the way to make contact with the front-end (security) and how to start a front-end service,
iii. the definition of a few commands which a front-end must understand.

As the GUI should be as general as possible it can not hold itself any measurement specific information. It is also not preferred to maintain a large number of specification files in a central place, which describe each and every detail of all setups and the associated GUI. The logical place to maintain setup specific information is in the corresponding front-end. The GUI can request this information, and then configure itself accordingly.

B. Access Control

For reasons of instruction and assistance it is desirable to be able to access a front-end with several GUIs simultaneously. To avoid interference between users the GUI is granted either full or restricted access based on user rights. A user can also 'lock' its front-end, making it impossible for other GUIs to modify the measurement parameters.

C. Network Connection

The state of the front-end is in principle unknown to the GUI: it may have crashed, maybe it is rebooted or switched off, or performing a high priority measurement operation. To avoid problems the TCP/IP connection is build up whenever needed and terminated again after data has been transferred.

D. Front-end Output

Output from the front-end to the GUI can be *solicited* or *unsolicited*. Solicited data are returned upon receiving a command. Unsolicited data are generated on initiative of the front-end itself. These are mostly informational messages or error messages.

Unsolicited data are send to all GUIs, which are known to the front-end. For this purpose an internal list is maintained containing the addresses of the workstations which contacted the front-end. When sending fails the host is removed from the

list. To capture the unsolicited data a GUI must always have a TCP listener service running. For the case no GUI is active the messages are also kept in a message area on the front-end.

An important type of informational message is the announcement of a change in the value of a measurement parameter. Such a change can be made by the user, or it can originate from the running measurement. The change is reflected on all GUIs referring to the front-end.

E. Measured Data

At the end of a measurement the measured data are not send to the GUI, because there is no guarantee that it is active. Instead the data are written to a data area on a central computer on the LAN, and in addition if possible kept on disk in the front-end.

III. GUI Functional Blocks

The block diagram of the GUI is shown in figure 2. During the Init phase experiment specific setup data are requested from the front-end. These data include:

i. the commands known by the front-end
ii. the parameters known by the front-end and their values
iii. which subroutines to load into the GUI.

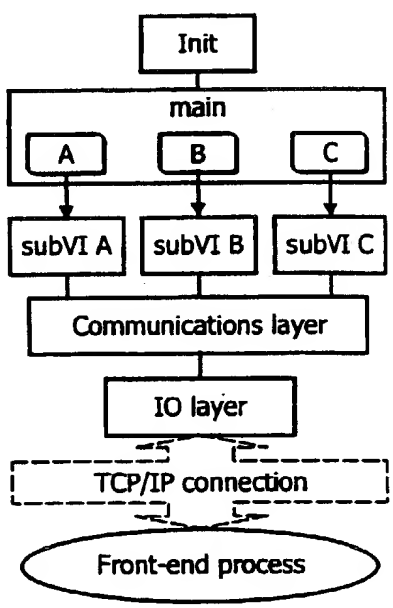

Figure 2: The logical structure of the GUI.

Using the latter information the GUI constructs its main front panel, consisting of labeled buttons, A, B etc. These buttons start and stop the respective subVIs [5], which perform the task related to the button. A subVI usually opens its own front panel, allowing the user to set options and execute commands. Some subVIs are required by every front-end, performing common tasks such as the execution of a command, the modification of a parameter value, or displaying data. Other subVIs are related to specific front-end needs.

The subVIs communicate with the front-end via a communications layer, which takes care of the formatting of the transmitted data. The IO layer contacts the front-end and performs the actual data transmission. Contacting the front-end involves a password check to avoid unintended access and subsequent disturbance of the measurement by systems on the Internet.

IV. Status

The GUI is under development at the moment (may 1999). The IO layer as well as the communications layer are completed, while the Init and main VIs are operational. Some basic subVIs are already functional.

By the groups involved a considerable amount of programming effort has been undertaken to prepare the various front-ends to comply with the communications protocol mentioned. The planning is that by the end of 1999 the GUI will be available for the users.

V. References

[1] LabVIEW is a trademark of National Instruments Corporation, 6504 Bridge Point Parkway, Austin, Texas 78730-5039.

[2] Interfaculty Reactor Institute, Mekelweg 15, 2629 JB Delft, The Netherlands.

[3] VxWorks, Wind River Systems, 500 Wind River way, Alameda, CA 94501, U.S.A

[4] OS9, Microware Systems, Beech Court, 27-33 Summers Road, Burnham, Bucks SL1 7EP, U.K.

[5] A VI or 'Virtual Instrument' is in fact a LabVIEW subroutine.

An Open System To Interface IEEE-488 Measurement Devices Designed in a Microelectronics Environment

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February 15, 1996

Abstract

The high production level in microelectronics, leads to the need of using automated data acquisition and data analysis methods.

Since often highly specialized measurement devices are used, a method is presented in this report, to build a high-level interface between the user and the measurement devices.

This report proposes to use the capabilities of modern computer systems to enable parallel and remote access to measuring devices via a networked host without having to use a dedicated unit to perform this task. An approach is described on the basis of typical PC-compatible computer running the Linux OS and "Open Implementation" software.

I. Introduction

The aim of any automated production line in the field of microelectronics is to ensure the maximum level of high-quality integrated circuits. To know the production quality, microelectronics industry has to rely on the characterization of their products. Due to high production levels, automated characterization techniques are helpful if not mandatory.

Among other characterization techniques (physical, optical, etc), the electrical measurement is the most suitable technique used in an automated approach. This technique is based upon specific test structures, on which tailored electrical measurements are performed providing a reduced set of key parameters.

Generally high precision measuring equipment is used to acquire a set of parameters. Extracting parameters from measurements gives insight about the quality of the different processing steps. The analysis is usually left to a computer exclusively dedicated to this task, i.e. a typical scenario could be a PC-compatible computer

running some sort of software in order to interface the acquisition devices.

This report focusses on an implementation of a high-level interface to measurement devices, performing the measurements on computers running UNIX-like operating systems. This way multitasking and multiuser capabilities of the host are used for performing parallel and remote measurements without blocking the CPU while enabling data exchange with networked workstations used in microelectronics design and analysis.

To maximize system portability a POSIX compliant OS (Linux) was chosed, together with the X windows system.

Within the different possibilities to program X applications, the Tk [1] toolkit was chosen because of its completeness and ease to interact. Although the Tcl [2] language is commonly used to interact Tk, the scheme/Tk (STk) [3] language was used instead because of its powerfull data structures and OO approach.

Using this programming tools, a virtual measurement device is build as a first step into the automation of microelectronics characterization, keeping it as an open and distributed implementation.

II. System Description

A view of the system architecture is shown in figure 1. Different software layers are necessary to build a characterisation environment:

- *IEEE-488 bus* to resolve connection from a measurement device and a host, in this case a PC-compatible computer [4]. A low-level driver was implemented as a loadable module for the kernel. As a special feature this module manages parallel access to measurement devices.

- *Device Driver Interface* where the distributed system is implemented, granting remote access to the local GPIB devices provided by the local bus driver.

- *Application Interface* providing a set of standard *widgets* for writing graphical interface applications. Its also where the measurement device interface is standarized.

- *Application Program* which can use all the given resources to create a tailored measurement strategy.

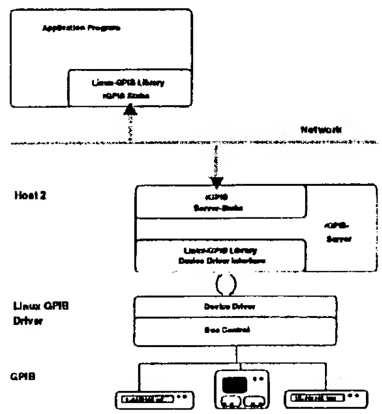

Figure 1: System architecture.

A variety of software exists on the market to design measurement applications, but they lack from important features when using them in a R&D environment,

- systems that can't provide multitask capabilities, or very weak ones because they are not defined in the OS kernel. A measurement will use the full capabilities of the controlling computer.

- systems that are closed, making very difficult for the user to extend its capabilities adapting it to their actual needs. For instance, there is no way to create a driver for a new measurement device.

As there are great variety of possible measurement needs, its important to keep the system as

open as possible, increasing accessibility and flexibility. Application developers are able to add new features as they are needed.

III. Programming

Being this mostly a programming job, it is centered onto the development of tools implementing a high-level interface between human operators and *GPIB* devices. An easier use of these devices should therefore be possible.

To solve graphical interface, the X protocol was used. Therein the *Tk*-Toolkit [5] was found to allow a user to build whole applications including various general interaction elements like buttons, lists, etc. called *widgets.*

The capabilities of the *Tk*-Toolkit was originally designed to be accesible using the high-level programming language *Tcl.* Since *Scheme* [6], a lisp derivative, as a programming language is more powerful and flexible than Tcl, the *STk*-package (Scheme-Tk) was used to implement virtual measurement instruments.

IV. Implementation

Implementing graphical support for *GPIB*-devices takes place at various levels: low level driver, commands, *widgets* and applications:

- *low-level drivers* are integrated into the kernel of the OS and should not be directly accessed by the user's applications. Access to the GPIB interface is accomplished through Tk-commands.
- Support for *GPIB*-devices has been added to *STk* via new *STk-commands.*
- *Tk-widgets* emulating special elements found on the measurement devices.
- *Applications* handle the user's inputs to generate the appropiate commands to the *GPIB* devices connected to the host, eventually using the new *widgets* to emulate a whole device on screen.

A. *STk-commands*

A new command to acces *gpib* has been added to the set available to *STk* application writers. Some examples of its usage follow,

```
(gpib find 'lab1:hp7550')
(gpib read dev buf)
(gpib command dev 'UNL UNT')
```

the first line opens device hp7550 on host lab1 returning a descriptor and leaving it ready to receive commands, then the device could be accessed to send commands. When a device is opened, it gets locked for application usage. Other devices on bus could still be used.

B. *Tk-widgets*

A series of new *widgets* for the *Tk* package has been written in order to implement some of the control elements commonly found on measurement devices. *Widgets* showing a rotatory knob and a LCD-Display have been integrated into the local *Tk* package. Examples of the implemented *widgets* can be seen in the following figures. Figure 2 shows a basic LCD-display where each segment, decimal points and a flashing cursor can be set via options and commands to the widget.

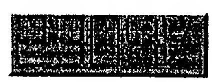

Figure 2: LCD widget for the Tk package

C. *Applications*

As an example of how these new programming elements may be used, an application has been written, that implements a virtual frontend of

a "*Keithley 237 high voltage source measure unit*" [7], which behaves as the device front panel. Much work has been put into the assembly of the different *widgets* to form the whole application. This part is not as tricky as implementing the functionality of the application to perform exactly like the physical device does.

The approach described in this report has proven to be useful although it's capabilities are still to be used to the most.

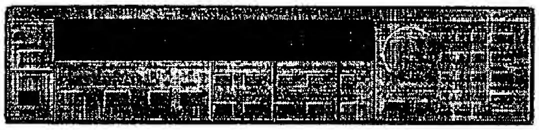

Figure 3: Graphical frontend for a Voltage/Current Source-Measure Unit

V. Future Work

Work has still to be put into porting the Tk-extensions presented here to newer versions of the *Tk* package, developing new *widgets* as these are needed. Also an OO approach will be used to standarize widget development.

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[6] Chris Hanson et al., *MIT Scheme Reference Manual for Scheme Release 7.3*, 1993.

[7] Keithley Instruments Inc., *Operator's Manual Model 237 High Voltage Source Measure Unit*, 1989.